

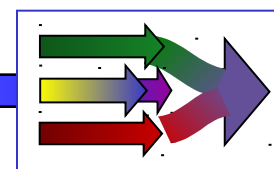
United States Army *Logistics Integration Agency*



Embedded Diagnostics and Prognostics Synchronization Report

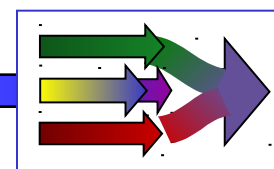
Information Briefing
13 January 2003

Materiel Logistics Division
Logistics Integration Agency
(717) 770-7600



Purpose of the Briefing

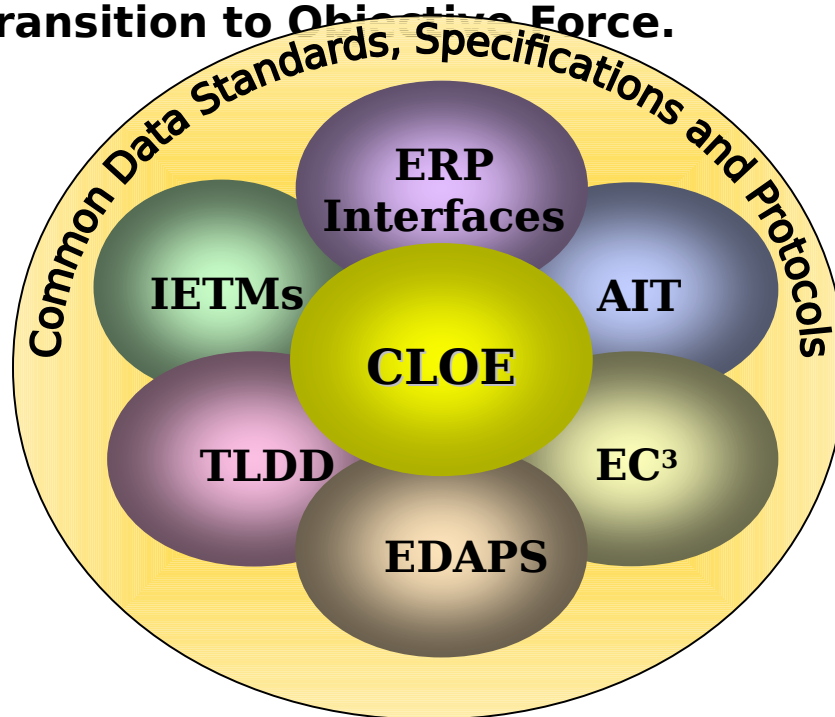
- **Provide an update on EDAPS accomplishments**
- **Present highlights from EDAPS Report**
- **Offer thoughts and obtain guidance on next steps**



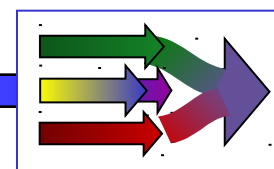
Where Are We Now?

Common Logistics Operating Environment

- **Synchronized application of selected technologies on all platforms in the interim force to automatically transmit timely logistics data.**
- **Accelerate transition to Objective Force.**



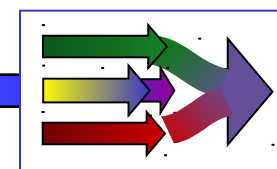
Derived from the EDAPS Concept



EDAPS Concept

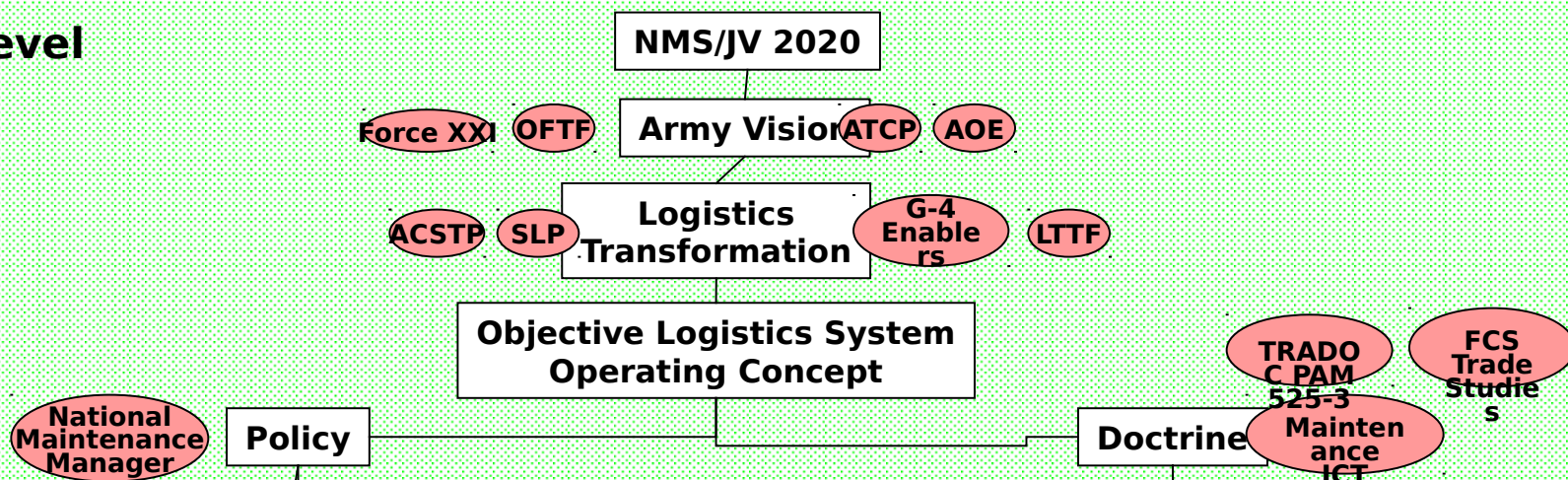
A **process** that **defines the vision** and **synchronizes** individual ED/EP efforts to a **common architecture**.

The EDAPS **end state** is a set of synchronized programs working within a **common framework** to achieve the **benefits** of condition-based maintenance.

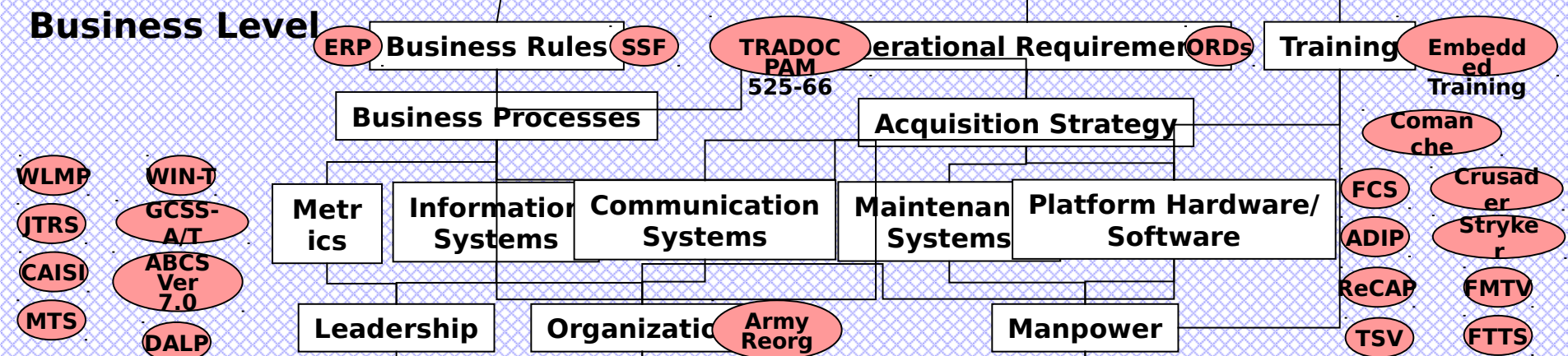


Synchronization Challenge

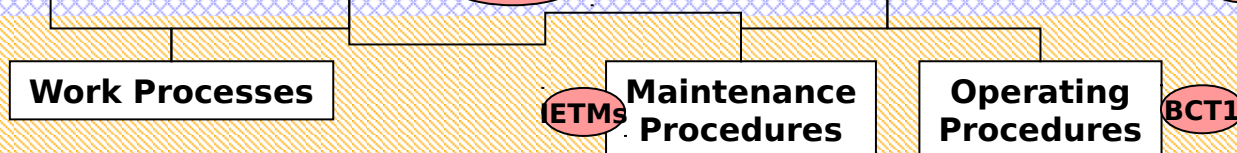
Strategic Level



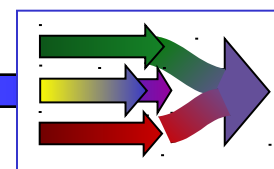
Business Level



Working Level



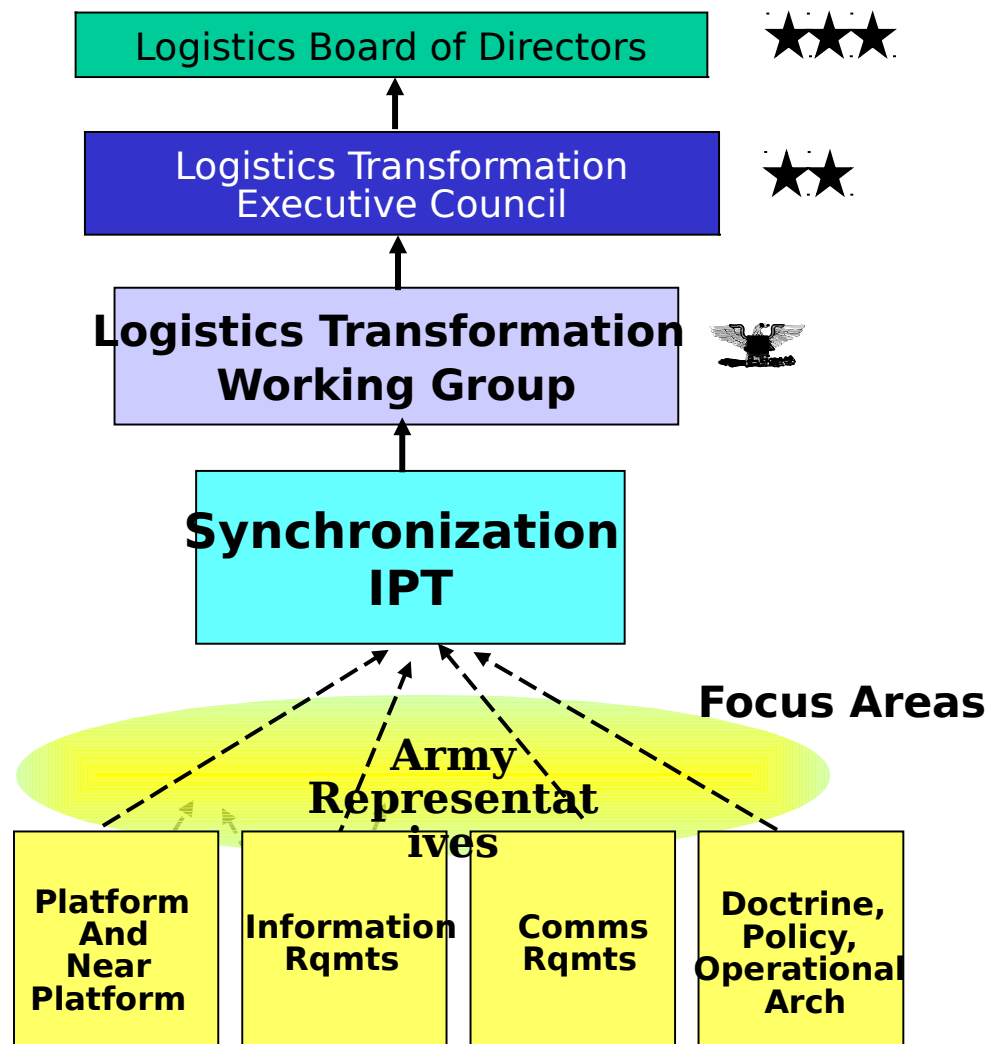
Sustaining The Transforming Army

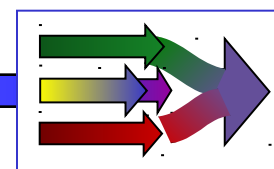


EDAPS Management Structure

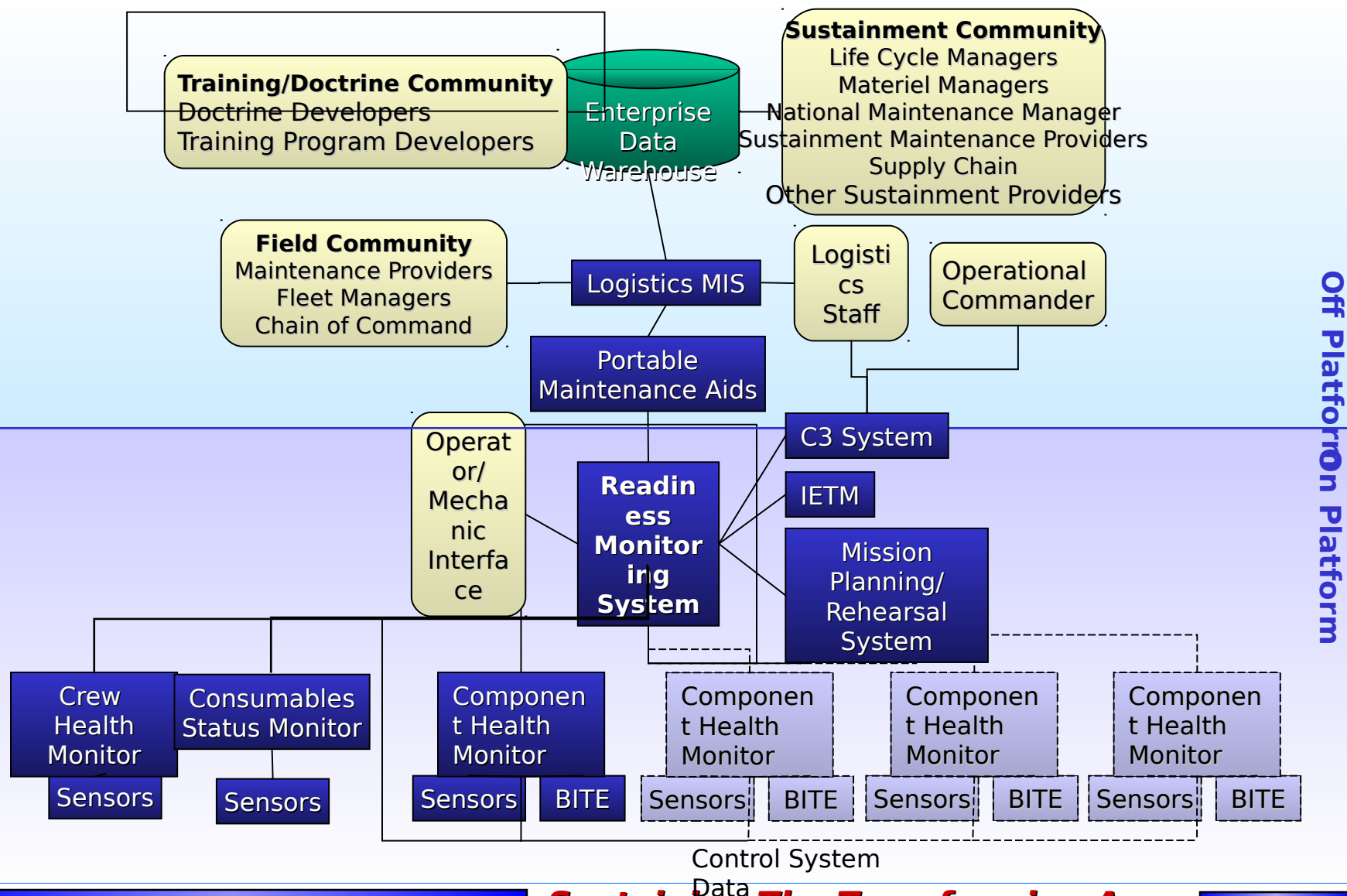
■ IPT Roles and Responsibilities

- Forum to resolve issues
- Oversee and guide focus area activity
- Seek consensus on issues and approaches
- Seek to resolve gaps and redundancies
- Identify resource needs, sponsor programs
- Propose solutions to LTWG, EC, BOD



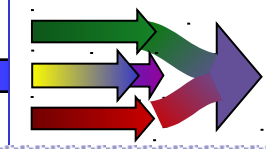


Operating Concept

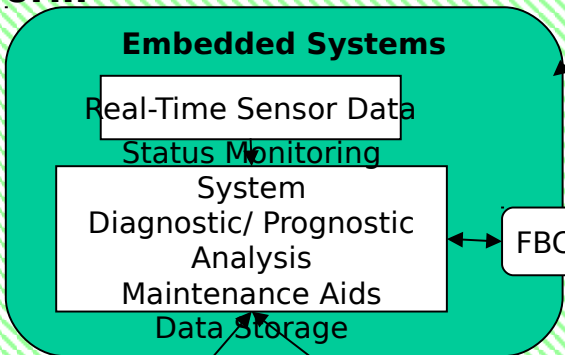




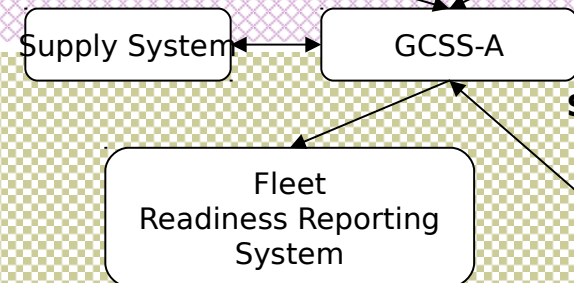
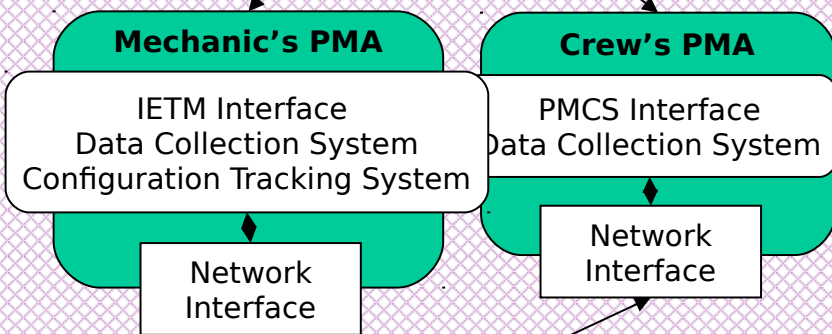
EDAPS Objective Force Architecture



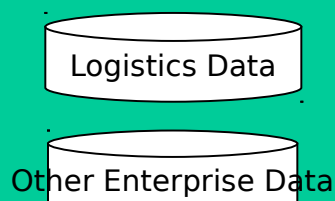
1. Platform



2. At-Platform Tools

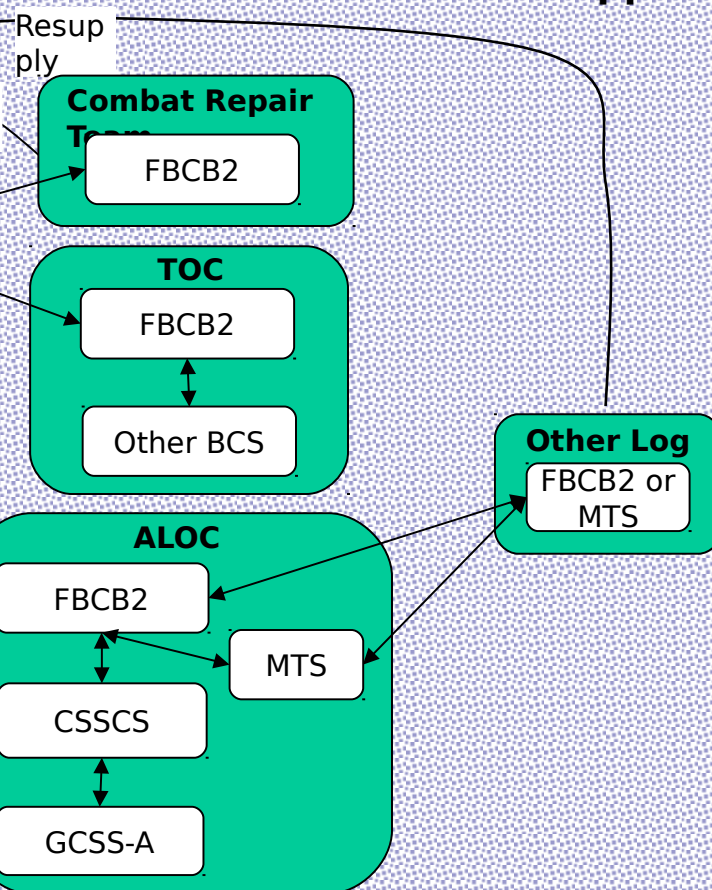


Shared Data Environment



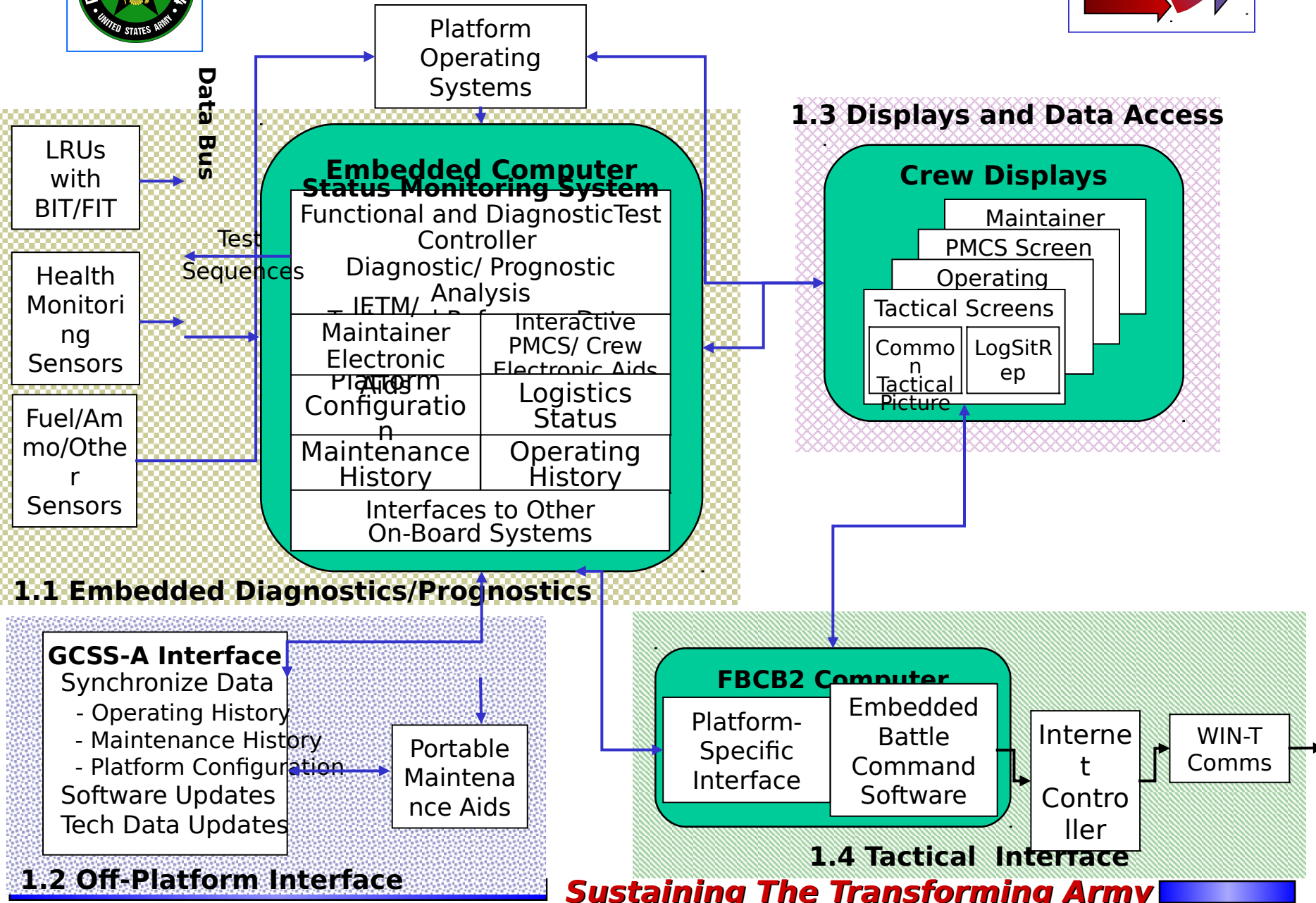
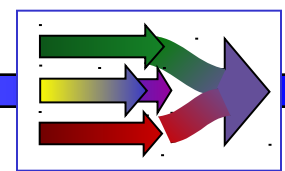
4. Sustainment Applications

3. Tactical Applications



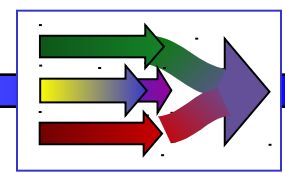


Platform



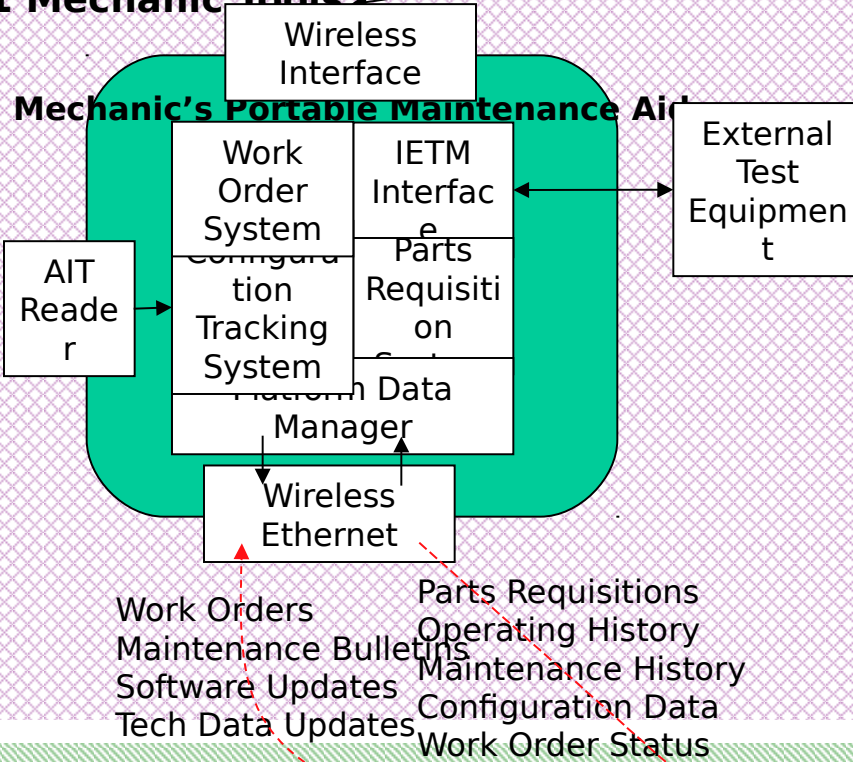


At-Platform Tools

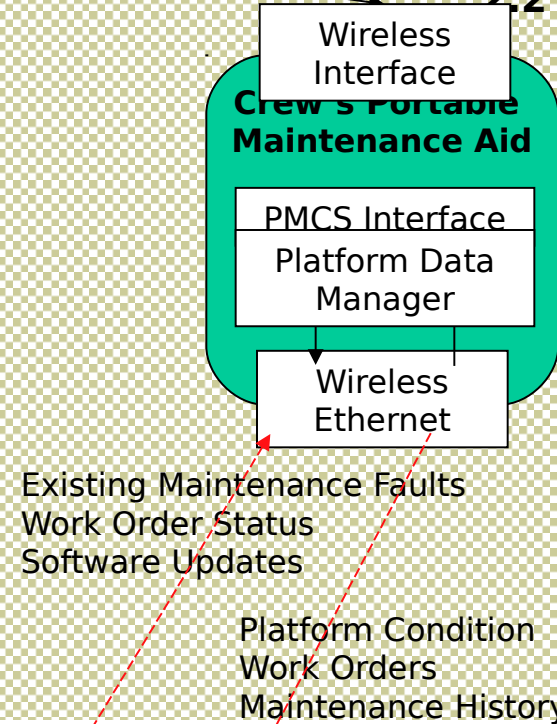


Platform Interface

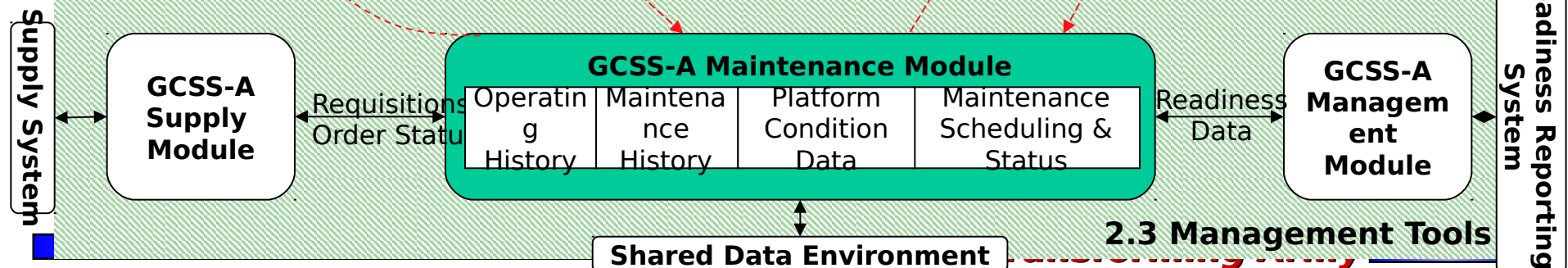
2.1 Mechanic Tools

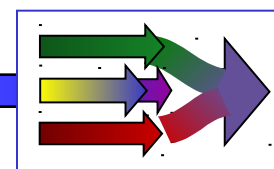


2.2 Crew Tools



2.3 Management Tools





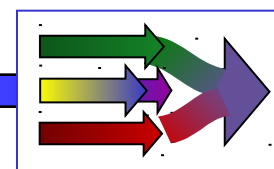
EDAPS Impacts & Accomplishments

EDAPS Report



- **Architecture, Data & Interface Contribution**
 - Operating Concept Strawman
 - Generic Platform ED/EP Requirements
 - Definition of Embedded Diagnostics and Embedded Prognostics
 - GCSS-A ED/EP Requirements and Platform Data Structure
 - FBCB2 ED/EP Requirements
- **Doctrinal Contributions**
 - FBCB2/Platform Interface
 - Changes to Army Policies & Publications
 - Business Process Models for Legacy and SBCT Maintenance
 - Platform & System ORD Reviews
- **Army Coordination & Synchronization**
 - Interface with LTTF, Logistics Transformation
 - Stryker Embedded Diagnostics & Prognostics Technology Demonstration
 - Aviation Demo Planning
 - Operational Architecture Working Group To Build Business Process
 - Support FCS Sustainment IPT
- **DOD Coordination**
 - Interface with CBM+ Task Force
 - Interface with Business Initiative Council for DoD 5000 Series

Sustaining The Transforming Army

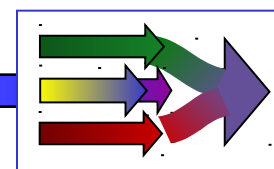


EDAPS Report



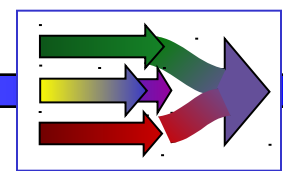
- **Vision for logistics processes enabled by self-reporting platforms**
- **High-level view of the EDAPS operating concept**
- **End-to-end system requirements to move information from platforms through wholesale levels**
- **Sustainment requirements of the Interim and Objective Force**
- **Pathway to integrate ongoing initiatives and focus resources on high-value programs**
- **Benefits associated with implementing EDAPS business processes**
- **Policy and doctrine change recommendations**

Basis for Common Logistics Operating Environment,
Stryker Demonstration, Brigade Experiment



Science and Technology

- **Current potential up to \$20M in S&T for ED/EP**
- **Working with CASCOM, ARL to develop investment strategy:**
 - **Internal ARL directorate meeting - early January**
 - **ARL workshop focus on research opportunities - mid-late January**
- **New STO proposal FY04**
 - **ED/EP physics of failure, predictive failure algorithms**
 - **Goal: product(s) that could be transitioned to 6.3 after 3-4 years**
- **Future meetings**
 - **Meet with CERDEC - 22 January**
 - **Meet with TARDEC - TBD**



Gaps - Examples

Resolved

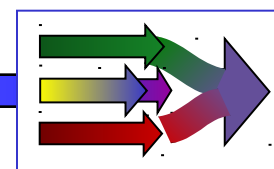
- **Vision Defined**
- **High Level Architecture Shaped**
- **Interactions Initiated**
- **Initiatives investigated**
- **Demonstration Planning**
- **IETM Authoring System Standardized**
- **Requirements process**

Impacting

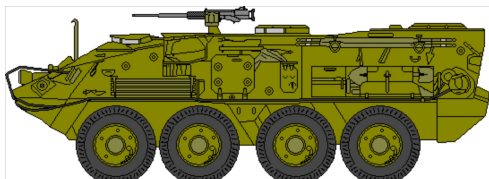
- **Maintenance Management Module**
- **GCSS-A - ERP**
- **Off-Platform Data Flows**
- **Business Processes**
- **Policy and Doctrine**
- **Adaptations for FBCB2**
- **Near platform Maintenance Aids**
- **Synchronization of Doctrine, Business Processes, Training, Information**

Open

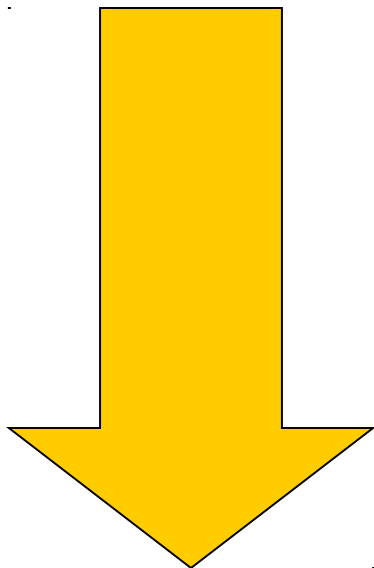
- **Definitive Reliable Logistics Communications**
- **Shared Data Environments**
- **Capability Event Horizon**
- **Limited EP Technology Investment**
- **Mixed-Mode Operations**
- **ED/EP System Leadership**
- **Inter-Service Collaboration**



Stryker Demonstration

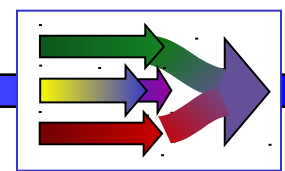


- **Doctrine & Business Process Update**
 - Condition-Based Maintenance
- **Technology Proof of Principle**
 - Embedded ED/EP Technology
 - Comm work-arounds
- **Synchronization**
 - TLDD
 - Embedded IETMs
 - Health Management
 - GCSS-A Interface



SBCT Experiment

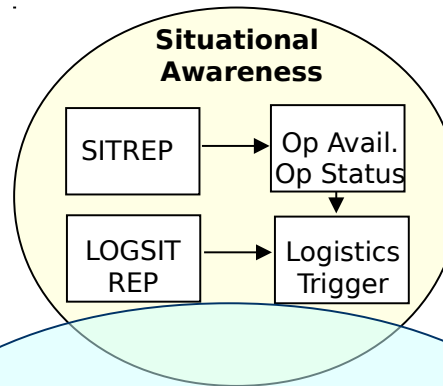
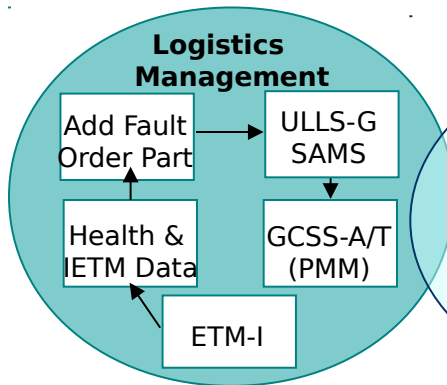
- Include All Weapon Systems and Tactical Wheeled Vehicles
- Assess Impact of Doctrinal Changes and Operational Benefits



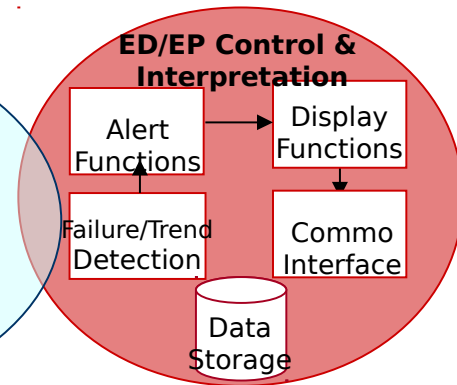
EDAPS Role in SBCT Experiment

Communications

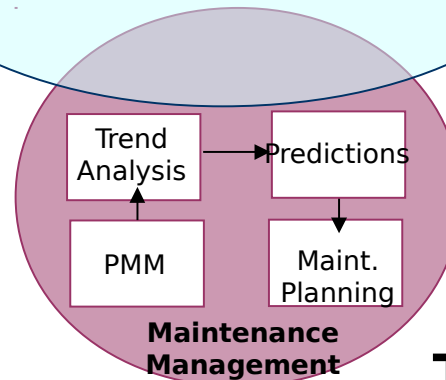
Logistics Modernization



Embedded Diagnostics

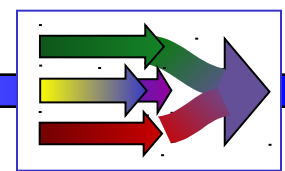


Ensure Synchronization & Interoperability



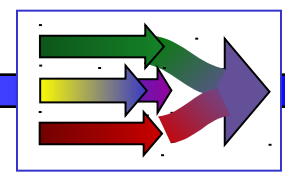
TAMMS

Sustaining The Transforming Army

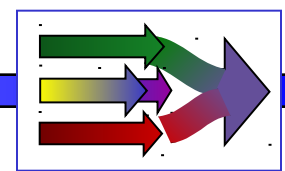


Future Activities

- **Operational Architecture for Objective Force Logistics**
- **CLOE Implementation Road Map - Who, What, When**
- **Business Case for CLOE and Other Critical Enablers**
- **Accelerate Fielding of Logistics Enablers**
- **Logistics Operating Concept for Transition Period**
 - **Mixture of Legacy, Interim, FCS Units**
- **Enterprise Integration**
- **Reliable, Timely Communication of Logistics Data**
- **ERP Interfaces**
- **Continue CLOE Synchronization**
- **Transformation Oversight for CLOE**



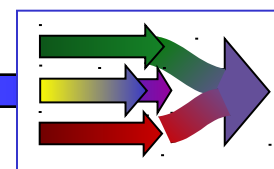
BACKUP SLIDES



Embedded Diagnostics and Prognostics Synchronization Report

G4 Army Tasked the Logistics Integration Agency (LIA) to Lead an Effort To:

- *Pull Together All the Key Players Across the Army and Come up With an End State That Balances All the Current Pilots/Programs/Plans.*
- *Integrate **Current Diagnostics and Prognostics Programs and Initiatives and Technical Approaches.***
- ***Identify Policy and Programmatic Gaps and Redundancies.***
- ***Define and Then Re-engineer the Operational Architecture and Its Business Processes From the Platform, Through Retail, and Into the Wholesale System.***



EDAPS End-State Vision

■ **Embedded health monitoring systems**

- Objective Force primary platforms (ground and air)
- Majority of mission-critical components

■ **Diagnostics capabilities**

- Autonomously isolate faults in mission-critical systems
- LRU or major component level

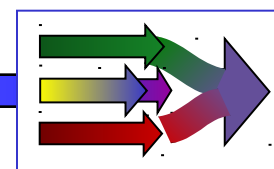
■ **Prognostics capabilities in many embedded systems**

- Predict failures in key systems
- Allow for scheduling of corrective maintenance actions and distribution of required repair parts.

■ **Embedded command, control and communications systems**

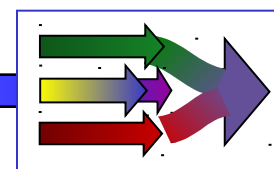
- Linked to embedded health monitoring systems
- Allow platforms to self-report health status, ammo status, fuel level, crew status, status of other mission-critical consumables, maintenance needs.





Benefits

- **Improved Readiness**
 - **Reduced MTTR**
 - **Predictive/condition-based maintenance**
 - **Anticipatory parts ordering**
- **Better Situation Awareness**
 - **Tactical Commander has real-time view of combat capability**
 - **Tactical Logistics staff have timely, accurate info on needs of forces and status of log assets**
 - **Sustainment system has near-real-time consumption data**
- **Improved Productivity**
 - **Reporting and paperwork burden removed from crew**
 - **Mechanics spend less time troubleshooting**
- **Reduced O&S Costs**
 - **Accurate data for analyzing and eliminating readiness and cost drivers**
 - **JIT inventory management**
 - **Reduced manpower**



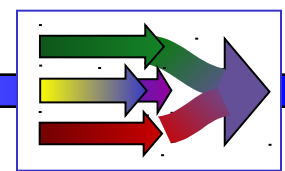
Institutionalizing ED/EP Requirements

■ Policy and Doctrine Publications Reviews

- Updated 10 key policy and doctrine publications to reflect ED/EP as a required enabler**
- Recommended changes to training base curricula**
- Institutionalized standard ED/EP definitions**
- Ensured ED/EP requirements reflected in DOD policy**

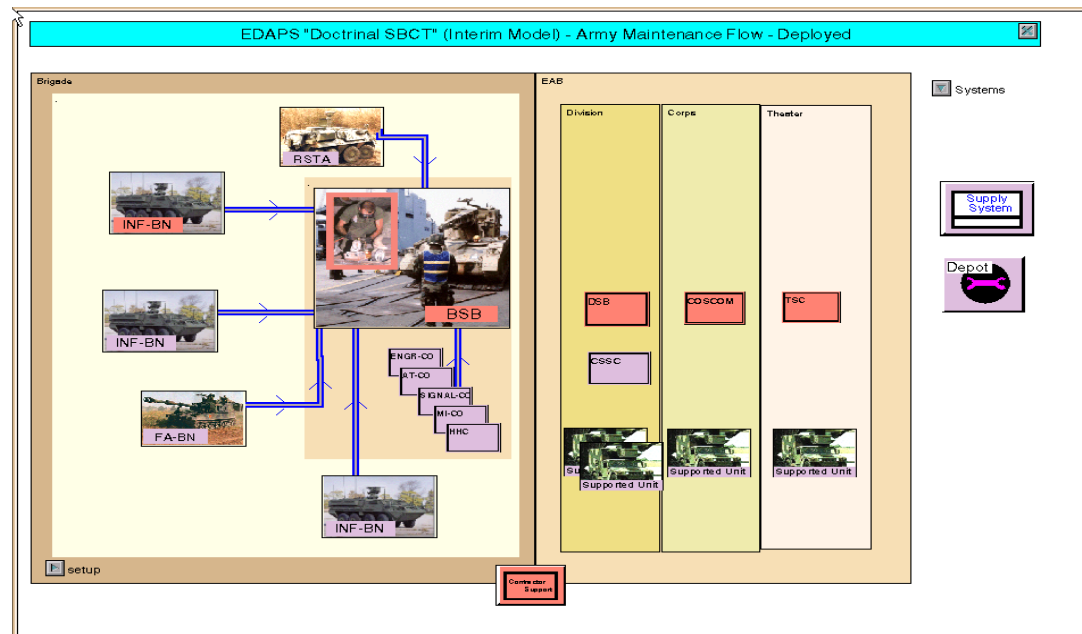
■ Operational Requirements Documents (ORD) Reviews

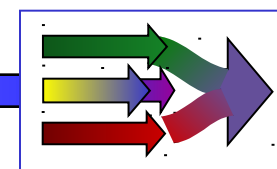
- Became part of TRADOC's ORD review process**
- Drafted and inserted new ED/EP requirements in ORD reviews**
- Working with FCS Supportability IPT**



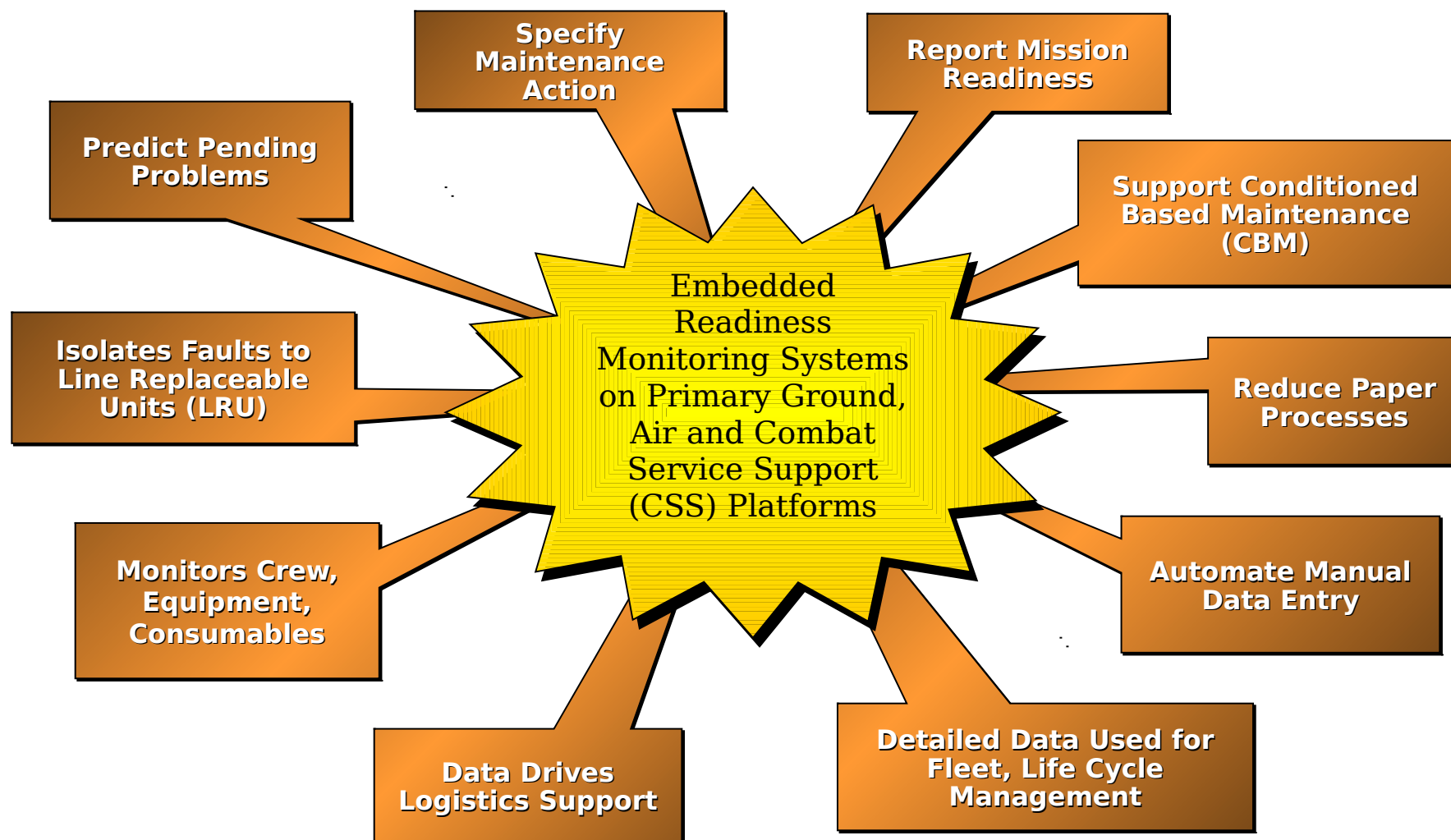
Business Process Modeling

- Builds on previous USALIA modeling efforts
- New models developed for Legacy and Interim Forces
- Facilitates understanding of operational concepts and quantification of costs and benefits
- Supports Stryker demonstration business decisions
- Supports development of business case





Embedded Readiness Monitoring System



Operational Architecture - Stryker Demo

